

Homework 1
1101 Principles of Microeconomics, Summer 2004
Due July 15

Solutions to problems must be TYPED except for calculations and graphs.

For full credit, graphs must be completely LABELED.

Be sure to justify your answers clearly and precisely for full credit, even if question does not explicitly ask for justification.

Give CITATIONS for help received to answer any of the following problems.

A maximum score for this assignment is 100 points.

A hard copy (as opposed to an e-copy) is required.

1. (9) Consider the following table

	Demand Schedule	Supply Schedule
Price (pesos)	Quantity (cubic meters)	Quantity (cubic meters)
10000	3	20
8000	4	10
6000	7	7
4000	10	6
2000	15	2

- a) Graph the demand and supply curve on the same axes. Label the competitive equilibrium. (3)
- b) Give a definition of a competitive equilibrium. (3)
- c) What is the competitive equilibrium? (9)
2. (13) Consider the following.
Demand: $P = 20 - 8Q$
Supply: $P = 2Q$
- a) Graph supply and demand. Label the competitive equilibrium. (3)
- b) Give a definition of a competitive equilibrium. (2)
- b) Calculate competitive equilibrium. (3)
- d) Show on a graph the effect of imposing a price ceiling of \$3 on the market for doughnuts. Calculate excess demand. (5)
3. (15) Consumer 1 has demand given by: $P = 40 - 2Q$
Consumer 2 has demand given by: $P = 10 - Q$
- a) Graph consumers' demand curves on the same plane. (3)
- b) Graph the aggregate demand curve on the same plane as in a). (4)
- c) Derive a formula for the aggregate demand curve. (4)
- d) Does the Law of demand hold for the aggregate demand? (2)

4. (16) For each of the following scenarios, state the effect of the event listed on the competitive equilibrium price and quantity. Use graphs to justify your answer. Note the graph must show general supply and demand curves for each good before and after the event occurs for the graph to be useful. There is no need to explain WHY there is a change in equilibrium.
- Pepsi and Coke are substitutes. There is a technological advance in the production of Pepsi. Show effects for both markets. (4)
 - Show the effect on the market for chocolate of the increase of gross domestic product in the US. (4)
 - Cross price elasticity of demand for chocolate and cookies is -2. Show the effect on the market for cookies of an increase in the price of chocolate. (4)
 - Show the effect on the market for books of an increase of the price of paper. (4)
5. (6) Consider the following table describing demand for vanilla pudding.

Point	Price (\$)	Quantity
A	100	50
B	75	60
C	60	70
D	50	80
E	25	90

- Using the midpoint formula, calculate PED between points A and B. Is demand elastic? (2)
 - Using the midpoint formula, calculate PED between points C and D. Is demand elastic? (2)
 - Using the midpoint formula, calculate PED between points D and E. Is demand elastic? (2)
6. (16) Jarek consumes only coffee (X) and Red Bull (Y). His marginal utilities from consuming these goods are given by:

$$\begin{aligned} MU_x(X) &= 20 - X \\ MU_Y(Y) &= 20 - 2Y \end{aligned}$$

Jarek's income is \$25 and the prices are $P_x = \$3, P_y = \2 .

- Find Jarek's optimal consumption bundle. (5)
 - Check that the bundle you've found satisfies budget constraint. (1)
 - Derive Jarek's individual demand for coffee. (5)
 - Derive Jarek's individual demand for Red Bull. (5)
7. (15) Consider the following curves.

Supply: $P = 4Q$

Demand: $P = 150 - Q$

- a) Give a definition of a competitive equilibrium.(2)
 - b) Calculate competitive equilibrium. (3)
 - c) Calculate producer surplus, consumer surplus and total surplus. (5)
 - d) Suppose there is a price floor of \$45. Calculate consumer surplus, producer surplus and total surplus. Is total surplus greater than in c)? (5)
 - e) Suppose now there is no price floor, but the government taxes suppliers \$5 per unit sold. Calculate consumer surplus, producer surplus, government revenue, total surplus and deadweight loss.
8. (10) Show using graphs how elasticity of demand and supply can affect the tax burden carried by suppliers and consumers. Show an example with elastic demand, inelastic supply; inelastic demand, elastic supply; 'average' demand and supply.

